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An Examination of The
United States Navy's Ability to Conduct
Operational Fires

A Monograph
by

Lieutenant Commander John G. R. Wilson, USN
Surface Warfare



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School of Advanced Military Studies
United States Army Command and General Staff College
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ABSTRACT

AN EXAMINATION OF THE UNITED STATES NAVY'S ABILITY TO CONDUCT OPERATIONAL FIRES by LCDR John G. R. Wilson, USN, Surface Warfare, 70 pages.

The end of the Cold War has removed the challenge to the United States Navy's preeminence in maritime affairs. In wake of this development, how can the Navy best participate in coordinated joint and combined warfare against a land power? The operational level of war links strategy to tactics and represents a framework for the conduct of modern warfare. To determine if sufficient Navy fire support assets exist to support this concept of modern warfare, this monograph examines the fire support means and doctrines to determine the validity of operational fires as a possible Navy mission area.

This work initially examines the historical, strategic, and operational background of the issue. It then establishes the utility of fires using evidence and principles espoused by the classical military, naval, maritime, and air theorists. Next, a historical example is examined to demonstrate the importance of and past problems associated with operational fires. Current doctrine is examined to demonstrate the paucity of naval thought on this subject when compared with the other services. Present and future means of naval operational fire support are examined to determine whether sufficient assets exist to conduct operational fires. Finally, an analysis of the Navy's participation in the recent Gulf War is conducted to determine if the Navy performed fires at the operational-level, and if so, to what level of proficiency. This analysis is conducted using the criteria of "necessary and sufficient," "suitable, feasible, and acceptable," and "affordable."

Based on the analysis conducted, current naval assets are capable of conducting operational fires if sufficient planning time is provided to adequately develop and refine the individual cruise missile missions. This planning system, as currently configured, is awkward and not capable of responding to emergent battlefield requirements and extenuating circumstances. This planning system requires an upgrade to reduce the required planning time to construct and implement fire support and make fires more responsive in the support of the operational commander.

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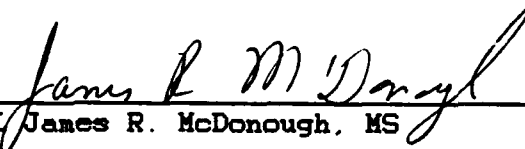
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INTRODUCTION

Principles and rules in the art of war are guides which warn when it is going to go wrong.¹

Captain Alfred Thayer Mahan, USN

Captain Steven Ramsdell, USN, of the Naval Historical Center, conducted a visit to the theater of operations during Desert Storm. The purpose of his visit was to interview a cross-section of individuals involved in the planning, coordinating, and commanding of naval carrier operations during the conflict. He completed seventy-three interviews, of which eight individuals were flag officers, four were captains commanding aircraft carriers, and six were captains commanding carrier airwings. Among his numerous conclusions, Ramsdell observed that

since the Vietnam War, a revolution in thought has taken place throughout the military services, except the Navy. At the center of that revolution is the concept of the operational level of war. . . . Desert Storm demonstrated the tremendous effectiveness of this approach to war.²

Ramsdell ended his trip report with the opinion that the Navy paid a significant price in its neglect of the non-technical education of its senior officers.

To correct this situation, Ramsdell believes the long-range solution involves changing the attitudes and increasing the knowledge of the Navy's officers. He judged that officers must come ashore and become educated in the art of war above the technical and material level.³

In light of this indictment, the purpose of this monograph is not to debate the existence of the operational level of warfare, but rather to assume it does, and examine

the conduct of fires at this level, and assess their viability as a mission for the United States (U.S.) Navy. The research question addressed is: Are naval forces capable of delivering operational-level fires in a theater of war?

The methodology used to answer this question involves an examination of the historical, strategic, and operational backgrounds of the U.S. Navy to set the stage for the remainder of the paper. Additionally, the theoretical foundations of warfare and naval fires will be laid. A historical operation will be reviewed to shed light on the importance of naval fires in a past campaign. The evolution of current and future naval warfare and its associated naval fires doctrine will be considered. The capability to support land warfare in a maritime theater of war will be scrutinized. These examinations will be conducted using the criteria of "necessary and sufficient," "suitable, feasible, and acceptable," and "affordable." Finally, conclusions will be drawn and the monograph will close with a discussion of implications for the future application of operational-level fires.

HISTORICAL, STRATEGIC, AND OPERATIONAL BACKGROUNDS

In a recent essay, Philip Crowl interpreted the nineteenth century naval historian Captain Alfred Thayer Mahan's concept of "sea power." Crowl defined it as both "command of the sea through naval superiority," and "that combination of maritime commerce, overseas possessions, and privileged access to foreign markets that produces national

wealth and greatness."⁴ The U.S. has historically called upon naval forces to apply the military aspects of sea power in times of crisis. For example, in its quest for independence, the U.S. relied on French naval power to defeat the British fleet and compel the surrender at Yorktown.⁵ The U.S., nevertheless, failed to sustain a sea capability, and "Britain's overwhelming numerical superiority in warships of all types enabled her to blockade the American coast and conduct amphibious raids almost at will"⁶ during the War of 1812. Thus, the importance of sea power was driven home to the U.S.

Thereafter, with the exception of that period between the Civil War and the resurgence of American sea power sparked by the writings of Mahan,⁷ the U.S. ensured it possessed a sufficiently powerful Navy to deter invasion. This fleet, however, has not always remained adequate to deter all forms of aggression against U.S. national interests. Pearl Harbor and the Korean Conflict are evidence that the existence of a strong American naval force is insufficient to deter threats globally. The American people, however, do not desire that their country want for sufficient naval power to protect their nation's interests. Why is this so?

One explanation is the fact that the very existence of the U.S. depends upon the sea. As illustrated by a former Chief of Naval Operations, the majority of our international ties are oceanic. Additionally, over 70% of our total trade

and 99.7% of our overseas trade moves by sea.⁸ The U.S. is not alone in this orientation. An examination of this planet

reveals that, with a few exceptions such as the United States [and the ex-Soviet Union], the bulk of capital wealth, technological fabric, and urban population centers are located within 50 miles of seas and oceans. In fact, nearly half of the world's manmade assets are found within 20 miles of its beaches.⁹

Because of this global arrangement, the Secretary of the Navy declared that "our naval power-projection capabilities will remain particularly useful in applying U.S. military might at appropriate places and times."¹⁰

As a maritime nation, then, the U.S. regards the seas as assets to those nations able to exploit their advantages, and as liabilities to those that cannot. In the decades since World War II, the U.S. Navy justified the maintenance of naval assets to counterbalance a burgeoning Soviet sea power. This rationalization arose from and was based on the U.S. "national strategy," which was defined as

the plan or expression of the coordinated use of national power which includes political, economic, psychological, and military power plus national will during peace, crisis, or war to secure national objectives.¹¹

The general nature of U.S. national strategy during the Cold War was translated into a policy of "containment."¹² U.S. naval forces represented one of the national military means available to "contain" the perceived aggressive ambitions of the Soviet Union and the related spread of communism.¹³

The end of the Cold War, however, dramatically altered the international environment.¹⁴ The relatively stable bipolar nature of world security shifted to an unstable multi-

polar situation in the wake of Soviet disintegration. The resultant power vacuum encouraged regional powers, freed from the yoke of superpower restraint, to "grasp the opportunity to assert themselves over their less powerful neighbors to enhance their wealth and prestige."¹⁵ The Iraqi aggression which precipitated the Gulf War is evidence of this premise. Logic dictated, therefore, that the U.S. "shift the objective of [its] national security strategy from containing the Soviet Union to [that of] maintaining global stability."¹⁶

President Bush outlined the modified U.S. defense objectives in support of a revised strategy as follows:

to ensure strategic deterrence, to exercise forward presence in key areas, to respond effectively to crises and to retain the national capacity to reconstitute forces should this ever be needed.¹⁷

Deterrence, therefore, still represents the cornerstone of U.S. policy and mandates that a sufficient and credible force dissuade potential adversaries from contemplated aggression against U.S. national interests.¹⁸ "Military strategy" represents the instrument with which to pursue deterrence. Military strategy is "the art and science of employing the armed forces of a nation or alliance to secure policy objectives by the application or threat of force."¹⁹

The U.S. intends to remain engaged in forward areas by maintaining a positive influence in regions vital to national interests.²⁰ Through military presence in these areas, U.S. military forces "can deter aggression, preserve regional balances, deflect arms races, and prevent the power vacuums

that invite conflict."²¹ As was the case in the recent Gulf War, however, the President recognizes that this nation must "remain prepared for our interests to be challenged with force, often with little or no warning."²²

These challenges, however, are most likely not represented by the possibility of global war, but rather, are manifested in the form of regional crises.²³ In addition to those identified in the national military strategy, classified documents leaked to the media indicate regional security concerns that represent possible threats to U.S. interests. These threats include regional conflicts involving Iraq, North Korea, Iran, and possibly a resurgent and expansionistic Russian Republic, as the aggressors. Additionally, a military coup in the Philippines that endangers U.S. citizens, and threatened access to the Panama Canal represent further concerns.²⁴ Whether or not these scenarios are predictive or represent "real" threats, the relevant question becomes not where, but how to respond to these crises in defense of U.S. interests?

The President declares that, in order to effectively apply military means, the U.S. must "be able to move men and material to the scene of a crisis at a pace and in numbers sufficient to field an overwhelming force."²⁵ In order to get this "overwhelming force" to the required location, "we must ensure unimpeded transit of the air and sea lanes and access to space through maritime and aerospace superiority."²⁶

The U.S. military strategy supports these concepts and further declares that this country retain

the ability to quickly establish control of the air, sea, and space both enroute and in the theater of operations. [These "superiorities"] provide for increased combat effectiveness, fewer losses, and efficient employment of combat power where it is needed most.²⁷

Army doctrine defines a "theater" as "a geographical area within which land, sea, and air operations are directed toward a common strategic aim."²⁸ Within this theater, current military strategy endorses "the concept of applying decisive force to overwhelm our adversaries and thereby terminate conflicts swiftly with a minimum loss of life."²⁹

Military strategy identifies the requirement for individual service capabilities to support theater commanders during crisis response. These capabilities include

naval forces capable of establishing and maintaining sea control and projecting power ashore ; amphibious forces capable of conducting forcible entry operations; and air forces that can strike an enemy's vital centers of gravity and achieve air superiority.³⁰

More specifically, this strategy foresees the requirement for naval forces capable of establishing and maintaining open ocean and littoral area control. In addition to delivering forces by sea and landing Marine amphibious forces, the Navy may support land combat with air power and cruise missiles.³¹

In light of the diminishing threat that the ex-Soviet Navy poses to the U.S. Navy, how can sea power be brought to bear upon a land force? Present military thought offers a framework for the integration of all combat power upon an enemy. The framework is called "operational art" and is "the

employment of military forces to attain strategic goals in a theater . . . through the design, organization, and conduct of campaigns and major operations."³²

Operational art translates strategic aims into attainable goals within a theater. It is the duty of the operational-level commander to apply operational art and link his ends, ways, and means. The commander defines ends (objectives), applies military means (forces), and utilizes ways (campaign plans, which include constraints and restrictions) to achieve strategic aims.³³

Thus, operational art sets the objectives and the pattern of military activities. The theater commander sets achievable, specific military objectives for tactical commanders by synchronizing (sequenced and/or simultaneous) operations in the campaign plan. "Tactics" remain the manner in which subordinate and supporting unit commanders translate combat power into victories within the theater.³⁴

At the operational level (for example, a Joint Task Force), six major functions occur in the theater to facilitate and set the conditions for tactical actions. These functions (maneuver and movement, fires, protection, command and control, intelligence, and support³⁵) are performed by possibly combined (International coalition) forces to coordinate the execution of campaigns and major operations.³⁶ Within this framework, fires are classified as operational "when their application constitutes a decisive impact on the conduct of a campaign or major operation."³⁷

THEORETICAL FOUNDATIONS

Hence, the peculiar and unique weight which true sea power can cast into the balance of power; sea power not merely as the sum total of a country's assets at sea--navy, mercantile marine, bases, oversea colonies--but in the deeper sense, in which the word was originally coined by no less a one than Thucydides: . . . the "Power of the Sea," the power which the sea confers upon him who knows how to conquer and to use it.[sic]³⁸

Herbert Rosinski

The "classical" theorists wrote little about fires and their conduct. Collectively, however, their works provide a point of departure for the understanding of modern warfare and the means to conduct it. Although none of these theorists witnessed the devastating potential of modern fire delivery systems, they all lived during times when fires were utilized in warfare. An examination of the theoretical underpinnings of fires would be incomplete, however, without an examination of the relationships of the other elements and principles of warfare. Although many of these principles were initially thought to apply only to land warfare, it is now recognized that the principles are timeless and apply to all warfare environments. Therefore, these principles are equally applicable to air warfare and war at sea, and should be examined to establish a firm foundation for naval fires.

Sun Tzu, a Chinese theorist who wrote between 400 and 320 B.C.,³⁹ noted many of these foundations of warfare. His premise that "all warfare is based on deception"⁴⁰ was complemented by his exhortation to "attack where he is unprepared; sally out when he does not expect you."⁴¹ This suggested combination of deception and surprise was meant to

encourage exploitation of defensive weaknesses. The Iraqi defense during the Gulf War illustrated weaknesses and vulnerabilities identified by Sun Tzu centuries earlier. He cautioned that

if he prepares to the front his rear will be weak, and if to the rear, his front will be fragile. If he prepares to the left, his right will be vulnerable and if to the right, there will be few on his left. And when he prepares everywhere he will be weak everywhere.⁴²

Deficiencies, however, cannot be exploited without the assistance of information and intelligence.

Knowledge is critical to the execution of operations.

Sun Tzu warned:

know the enemy and know yourself; in a hundred battles you will never be in peril. When you are ignorant of the enemy but know yourself, your chances of winning or losing are equal. If ignorant both of your enemy and of yourself, you are certain in every battle to be in peril.⁴³

Of perhaps equal importance to intelligence is the principle of speed.

Sun Tzu explained that "speed is the essence of war" when combined with surprise. "Take advantage of the enemy's unpreparedness; travel by unexpected routes and strike him where he has taken no precautions."⁴⁴ Commanders should harken the concern Sun Tzu voiced when he cautioned "invincibility lies in the defense; the *possibility* [emphasis mine] of victory in the attack."⁴⁵

The nineteenth century German theorist Karl von Clausewitz agreed. He believed that "defense is the stronger form of waging war."⁴⁶ To overcome this strength, Sun Tzu championed maneuver of "the extraordinary and the normal

forces. The force which confronts the enemy is normal; that which goes to his flanks the extraordinary."⁴⁷ Sun Tzu also recognized that maneuver is not the commander's panacea. He forewarned that "nothing is more difficult than the art of maneuver . . . both advantage and danger are inherent."⁴⁸ Maneuver was also insufficient to defeat an enemy; fires were required to consummate the attack.

Sun Tzu recorded the first suggested methods of attacking by fire: "the first is to burn personnel; the second, to burn stores; the third, to burn equipment; the fourth, to burn arsenals; and the fifth, to use incendiary missiles."⁴⁹ Fires delivered against these types of targets remain desirable today.

A contemporary of Clausewitz, the French theorist Antoine Henri Jomini, was influenced by Sun Tzu's analyses and contemporary authorities. Certainly Jomini was swayed by Napoleon's premise that "fire is everything, the rest does not matter."⁵⁰ Jomini also understood the effects of naval fires, albeit on the conduct of amphibious and not naval operations.⁵¹ He also agreed with Sun Tzu on the importance of deception and surprise.⁵²

The theorists Clausewitz and Jomini disagreed on how to apply maneuver and fires in war. Clausewitz felt that the enemy "center of gravity" represented the object of war, and he defined it as "the hub of all power and movement, on which everything depends. That is the point against which all our energies should be directed."⁵³ Clausewitz further believed

the center of gravity not only represented the most effective target for attack, but also the most dangerous threat to the friendly force.⁵⁴ Clausewitz also believed that in

a theater of war, be it large or small, the forces stationed there, no matter what their size, represent the sort of unity in which a *single* center of gravity can be identified. That is the place where the decision should be reached; a victory at that point is in its fullest sense identical with the defense of the theater of operations.⁵⁵

Therefore, Clausewitz felt that it was imperative to analyze this theater at the strategic level to determine the location and "sphere of effectiveness" of that center of gravity.⁵⁶

Jomini differed from Clausewitz. Although Jomini also believed that mass was the most paramount principle in war, he went further than Clausewitz and categorically stated that the principle fundamental to all operations of war was to throw the mass of an army and its fires on the "decisive points" in a theater.⁵⁷

Jomini defined "decisive points" as "points the possession of which would give the control of . . . the center of the chief lines of communication in a country,"⁵⁸ and recognized their identification as a tremendous challenge. If identified, however, Jomini felt that the art of war consisted of constructing a "line of operations" through these points and defeating them in detail through a combination of fire and maneuver. The construction of a plan to support this line was fundamental to campaign planning.⁵⁹

Therefore, the correct choice of location to focus attack depended on choosing a position that gave one

advantage over a decisive point or a line that linked decisive points. Jomini, however, determined that this choice was not sufficient to ensure victory. He felt that "if the art of war consists in throwing the masses upon the decisive points, it is necessary to take the initiative."⁶⁰ He believed maintenance of the initiative was important to retain the morale of the armies and nations, because morale was that ingredient which made victories decisive. In this era artillery fires, cavalry charges, and maneuver to the rear of the enemy represented the greatest moral effects. Thus, Jomini concluded with the belief that it was the attacker who possessed the advantage over the defender.⁶¹ While theorists argued that defense was the stronger form of war, the defender's uncertainty as to place and time of the attack gave the aggressor a possible advantage to exploit.

These theorists, however, failed to link land and naval warfare theory. This shortfall became evident when the nineteenth century American historian Alfred Thayer Mahan wrote of war at sea. Mahan's theories represented a separate thought pattern, because he viewed naval and land warfares as unrelated and separate disciplines of war.⁶²

There were, though, parallels between Mahan's view of war at sea and the early theorists' views of land warfare. Mahan fully endorsed the principle of mass. He termed it "concentration" and declared it "the predominant principle of naval warfare."⁶³ Offensively oriented, Mahan felt that "the primary mission of a battle fleet is to engage [and destroy]

the enemy's fleet"⁶⁴ through fires. Quoting the Civil War era Admiral David G. Farragut, USN, Mahan insisted that "the best protection against the enemy's fire is a well directed fire from our own guns."⁶⁵

The twentieth century theorist Sir Julian Corbett attempted to clarify the relationship of naval and land forces. Like Jomini, Corbett was concerned with lines of operations. Instead of the Mahanian sea power, Corbett chose "command of the sea" and defined it as

nothing but the control of maritime communications, whether for commercial or military purposes. The object of naval warfare is the control of communications, and not, as in land warfare, the conquest of territory.⁶⁶

He also proposed that no separation be drawn between army and naval operations. He regarded them as one force, the action of which should exist to achieve a united goal.

Corbett, unlike Mahan, subverted naval operations as part of a larger maritime strategy. This strategy determined fleet movements in relation to land forces actions.⁶⁷ As Corbett noted, a navy role in maritime strategy was theater isolation to facilitate defeat of a continental opponent.⁶⁸ Corbett encouraged coordination because he determined that it was impossible for command of the sea to decide the outcome of any war.⁶⁹ He realized that

since men live upon the land and not upon the sea, great issues between nations at war have always been decided—except in the rarest cases—either by what your army can do against your enemy's territory and national life or else by the fear of what the fleet makes it possible for your army to do.⁷⁰

Like Jomini, Corbett considered elements of the war plan essential. Corbett envisioned the maritime war in phases: (1) seize the territorial objective, (2) force an attenuated offensive on the enemy, and (3) return to the tactical offensive to force the enemy to accept terms.⁷¹

Thus, Corbett delineated how army and navy forces are integrated to achieve a common goal. Rather than address the importance of the lines of operations, Corbett generalized and professed that the paramount concern of maritime strategy was to determine the mutual relations of a nation's army and navy in a war plan. Corbett echoed Clausewitz that the war reflect the aim of political policy.⁷²

Corbett further borrowed from Clausewitz in his examination of the forms of war and found that offense and defense are mutually complementary.⁷³ Land and naval operations exhibit the synthesis of different aspects of warfare. The commander, in attempting to bring combat power to bear on the defender, is concurrently defending his force to preserve combat power. Like Sun Tzu, Corbett advocated deception and surprise and maintained that the advantage was secured by the side which seized the initiative, either by dexterity or stealth.⁷⁴

The mid-twentieth century theorist Herbert Rosinski re-examined naval theory. He defined the limit of sea power's capacity to support land struggles in terms of fires, as the maximum range of naval gunnery.⁷⁵

After World War I, air power began the transition from land-based to include naval-based operations. Like the theory of war at sea, air warfare theory traced its roots to ground combat theory. The Italian theorist Giulio Douhet declared mass as the first principle governing air operations.⁷⁶ An advocate of offensive operations, Douhet felt that "the material and moral effects of aerial offensives . . . are greatest when the[se] offensive[s] are concentrated in time and space."⁷⁷ Recognizing the dangers of attrition- or exhaustion-based styles of warfares, Douhet encouraged commanders to pursue annihilation and "inflict the greatest damage in the shortest possible time."⁷⁸

The American air power advocate Brigadier General Billy Mitchell, U.S. Army Air Arm, echoed Douhet's mindset. He further identified targets for air-delivered fires as

enemy aerodromes, concentration centers, training camps, personnel pools, transportation centers whether rail, road, river or canal, ammunition and supply dumps, headquarters of staff commands, forts and heavily fortified positions, trains, convoys, columns of troops, bridges, dams, locks, power plants, tunnels, telephone and telegraph centers, manufacturing areas, water supplies and growing grain.⁷⁹

More recently, Colonel John Warden, USAF, recognized the impact of emergent technologies upon war. Warden advocated flexible force application, stating that "the theater commander must determine whether he can best attain his objective with air, sea, or land forces."⁸⁰ That force best suited for objective attainment would be declared the "key force." This force would receive priority of support and

emphasis in the planning and execution of the operation.⁸¹ Warden, however, would limit the air assets initially available to a ground commander. Like the early air theorist Douhet, Warden believes that air superiority is the priority of all air forces.⁸² Warden defines air superiority as "having sufficient control of the air to make air attacks on the enemy without serious opposition and . . . incursions."⁸³ Warden states that "if air superiority is accepted as the first goal, then clearly all operations must be subordinated to its attainment."⁸⁴

Warden, therefore, would advocate limiting the air assets available to a commander conducting land or sea operations concurrent with major air operations. In doing so, Warden would force the commander to rely on other forms of fires to support these operations. If one accepts that the goal of air superiority applies to carrier-based aviation as well as land-based assets, then other sources of naval operational fires take on increased importance in their contribution to ground combat operations.

These theorists, then, provide a common point of departure for the examination of modern warfare. Each of them offer nuggets of knowledge that bear on the conduct of modern warfare, regardless of the environment (land, sea, or air). Of particular interest are the thoughts relevant to the construction of campaign plans: the concepts of air superiority and sea control, the relationship of fire and maneuver, the location of center or centers of gravity and

decisive points, and the linking of these foci by lines of operations.

HISTORICAL EXAMINATION: GALLIPOLI

The attempted passage of the Allied fleet past Gallipoli during World War I to bombard Constantinople represents an early attempt at naval operational fires. The **NECESSARY** or "essential and indispensable"⁸⁵ strategic aim of this operation was to remove pressure on the Western Front and support the Russian Allies by threatening Entente forces on a front perceived as vulnerable.⁸⁶ Allied leaders believed a naval force was **SUFFICIENT** or "equal to the end proposed."⁸⁷ They felt this force could quickly gain success by bombarding Constantinople and knocking Turkey out of the war.

Allied forces perceived the Turkish center of gravity as the fragile government of the "Young Turks" and their will to remain committed to a war. Additionally, the coastal location of Constantinople and the resultant vulnerability of the country's only two munitions factories magnified Allied perceptions⁸⁸ of the **SUITABILITY** or "appropriateness"⁸⁹ of the targets. This line of reasoning was encouraged by earlier

achievements of heavy howitzers against the forts of Liege and Namur [in Belgium and] were generally believed by [British] ministers to presage the success of modern naval gunfire—especially the new 15-inch guns—against the antiquated works at the Dardanelles. Above all it was felt that no great harm would be done, even if the operation failed. If satisfactory progress [was] not made, the bombardment could be broken off and the fleet could steam away.⁹⁰

Thus, the Allied command determined that this attempt was **AFFORDABLE** or that they had the ability "to manage or bear [the] cost without serious loss or detriment."⁹¹

Therefore, the Allies constructed a line of operation to attack the "center of gravity" via "decisive points" represented by the defenses between the Dardanelles and the government facilities and munitions factories at Constantinople. The resultant plan called for a four stage operation and included: attack of the forts at the entrance to the Dardanelles and inside defenses including the forts at the narrows; clearance of the minefields and reduction of the defenses above the narrows; final advance into the Sea of Marmara; and bombardment of facilities at Constantinople.⁹²

Not all Allies found this endeavor **FEASIBLE** or "possible."⁹³ Admiral Sir John Fisher, First Sea Lord, studied the possibility as early as 1904 and remarked that such an operation would be "mightily hazardous."⁹⁴ In 1915, his opinion against this operation was still strong enough for him to tender his resignation over renewed interest. Lord Kitchener, the Secretary of State for War, and Sir Winston Churchill, First Lord of the Admiralty, persuaded him to remain and conduct this operation.⁹⁵

It was later charged that Churchill erred in support of operation against Turkey because he "over-estimated the value of naval guns with low trajectory against land defenses."⁹⁶ This over-estimate resulted from the belief that the 15-inch guns would be more **SUITABLE** than past systems, because they

represented the largest guns ever made. These guns and projectiles, however, were designed and constructed to defeat the heavy armor of other battleships. Thus, these systems were employed at Gallipoli in a manner for which they were not designed, despite the initial paucity of Turkish defenses. The bombardments failed to accomplish the desired results chiefly because "the guns [were of high velocity and] flat trajectory, [and] only fired [armored piercing] shells that were inefficient against defiladed . . . positions."⁹⁷

The failure of this operation, however, had many components. Initially, the defenses were neither in-depth nor formidable. In 1914, the entire works consisted of 11 forts, 72 guns, several torpedo tubes, a few searchlights, one anti-ship minefield, and one anti-submarine net.⁹⁸ Of the guns employed, "barely a score of the guns were of modern design, and ammunition was in short supply."⁹⁹ This defensive scheme was upgraded by the Turks under German supervision.¹⁰⁰

The upgrade resulted from Allied violation of the principle of surprise. On 03 November 1914, the British and French combined fleet bombarded the entrance to the Dardanelles. This isolated incident alerted and disturbed the Turkish fortress commander, who later remarked "the bombardment . . . warned me and I realized that I must spend the rest of my time in developing and strengthening the defenses by every means."¹⁰¹ The fleet conducted several other bombardments prior to the main assault of 18 March 1915, all of which further warned the Turks of Allied intentions.

The major assault up the Dardanelles was constantly delayed due to adverse weather.¹⁰² Additionally, the effectiveness of the major assault was degraded due to lack of intelligence because

the seaplanes, which should have acted as spotters to enable the fleet's gunnery to range on the shore-batteries, were constantly frustrated by weather conditions which prevented their taking off.¹⁰³

Mine warfare played a significant part in the Allied defeat. The restricted channel permitted the Turks to economically mine the approaches to the defensive works. To sweep these mines, Allied minesweepers had to precede the larger armed vessels. Thus, the minesweepers had to go in relatively unprotected. The vessels were small, unarmed trawlers crewed by civilians unwilling to face fires without protection. Thus, these civilians refused to proceed in harm's way, necessitating the fleet commander's solicitating for fleet sailor volunteers to man these vessels.¹⁰⁴ Consequently, the minesweepers' crews were relatively untrained and lacked proficiency. On 13 March 1915, a determined effort to sweep the approaches to the Narrows involved six trawlers and the British cruiser *Anethyst*. This futile action ended when all but two trawlers were put out of action by the shore-batteries.¹⁰⁵ In what should have been a widely recognized foreboding, this incident was ignored and the major assault was finally initiated on 18 March 1915.

The attack, however, was commanded by Vice Admiral J. M. de Robeck, Royal Navy. Previously the deputy commander of

the formation, he assumed command when his superior was placed on the sick list for what may have been a stress-related illness.¹⁰⁶

Thus, the attack commenced. During the day, three battleships were sunk by mines and three others so badly damaged by the combined effects of mines and shore fires that they required docking for repairs.¹⁰⁷ Although he suspected mines, de Robeck was unsure of what actually caused the damage and he temporarily halted the attack.¹⁰⁸

The Allies later abandoned this form of attack. To further facilitate the safe passage of the fleet, they resorted to an amphibious assault to seize the Gallipoli Peninsula and the shore defenses overlooking the Dardanelles. Unknown to the Allied commanders, their naval attack almost succeeded because "the Turkish guns had expended more than half their ammunition, including almost all of that for the heavier guns, the only ones capable of severely damaging battleships."¹⁰⁹ Only one third of the Allied naval combat power had been lost in combat with the Turks. Even if one considered the losses as **UNACCEPTABLE** or "unsatisfactory,"¹¹⁰ the force remained substantially intact.¹¹¹

However, the Turks had imposed their will upon the Allies commanders by having achieved moral ascendancy. The Allied naval commanders lost their will for continued assault up the Dardanelles although they never abandoned plans for further naval bombardment of Constantinople.

Under modern analysis, this operation may have been **FEASIBLE**. The endstate was clearly defined. A center of gravity at the strategic level was identified, and operational decisive points were recognized and their attack planned. The campaign devised a line of operations and delineated the ways to attack these points. However, the force structure assigned possibly lacked the means to defeat these decisive points. Additionally, surprise was violated and the attack was piecemeal rather than massed. While possibly sufficient combat power remained following the main attack, the Allied command lost the will to continue.

CURRENT DOCTRINE

The really decisive successes have come to those who adopted a new doctrinal concept to which their enemies were unable to respond.¹¹²

Colonel John A. Warden, USAF

Current "strategy" of the U.S. Navy supports the conduct of fires in support of land operations. However, no doctrine exists within the Navy which discusses the operational level of war. For guidance on the conduct of operational fires, naval officers must glean direction from joint publications and the doctrines of the other military branches.

Naval Warfare Publication 1, "Strategic Concepts of the U.S. Navy," delineates two primary naval functions: "sea control" and "power projection."¹¹³ Sea control is identified as either area or local and defined in a Corbettian manner as

control of designated sea areas and the associated air space and underwater volume. It does not imply simultaneous control of all the earth's ocean area, but it is a selective function exercised only when and where

needed . . . [and] is achieved by the engagement . . . or by deterrence.¹¹⁴

Like air superiority for air forces,¹¹⁵ then, establishment of sea control is the priority for naval forces. Once sea control is obtained, naval forces are free to conduct power projection operations. Power projection is conducted in support of sea control and for "strategic" purposes and is

a means of supporting land or air campaigns utilizing capabilities designed for naval tasks. Power projection covers a broad spectrum of offensive naval operations including . . . naval bombardment with guns and missiles of enemy targets ashore in support of air or land campaigns.¹¹⁶

The purpose of power projection should be to shatter the enemy's cohesion through a carefully orchestrated series of rapid, violent, and unexpected actions, thereby creating a deteriorating situation with which the enemy commanders cannot cope.¹¹⁷ In power projection operations, naval forces possess distinct political, logistical, and operational flexibility.

Naval forces may be positioned near trouble spots without the entanglements associated with land-based air and ground forces. By operating in international waters, naval forces possess and threaten combat potential without violating the sovereignty of another nation.¹¹⁸ Additionally, naval forces operate as self-contained logistics packages, able to commence combat operations upon arrival within striking distance of a crisis.¹¹⁹ Although eventual logistics support is required, a naval force can generally operate for defined periods of time independent of logistical tether.

Short of combat operations, naval force presence is often sufficient to influence events without the application of force.¹²⁰ This coercive and non-lethal capability makes naval power an attractive means to that nation which possesses the capability. Finally, sea control is flexible. This flexibility enables naval forces to conduct power projection once local sea control is established, thus preserving the ability to act without the establishment of total theater sea control.

The Navy's ability to project power ashore is termed "strike warfare." This capability is enemy force-oriented and defined as

the destruction or neutralization of enemy targets ashore through the use of conventional or nuclear weapons. This includes, but is not limited to, targets assigned to strategic nuclear forces, building yards, and operating bases from which an enemy is capable of conducting or supporting air, surface, or subsurface operations against U.S. or allied forces.¹²¹

At the tactical level, the Navy further identifies different strike warfare techniques as coordinated strikes (or deep tactical support), interdiction, armed reconnaissance, and close air support.¹²² Coordinated strikes are deep tactical strikes designed to destroy specific well-inland and highly-defended targets at known locations in order to reduce the enemy's combat logistics capabilities. These strikes generally require support aircraft to protect and assist in the conduct of the missions.¹²³ Interdiction strikes are those designed to destroy targets or to deny the enemy access to a geographical area.¹²⁴ Armed reconnaissance strikes are those

designed to destroy targets of opportunity or attack specific fixed or moving targets if no targets of opportunity present themselves.¹²⁵ Close air strikes are "designed to harass, neutralize, or destroy enemy ground forces that present an immediate or direct threat to friendly ground forces."¹²⁶

Although the above represent tactical methods for the conduct of strike warfare, several of these methods are translatable as means to conduct operational fires against operational targets. Unfortunately, the Navy's doctrinal description of targets is rudimentary and limited, identifying only two types of strike targets by the general physical classifications of "point" and "area."¹²⁷

For doctrinal discussion of operational fires, then, one must examine non-Navy sources. The final draft of Joint Publication 3-09, Doctrine for Joint Fire Support, declares that fires may be executed at the strategic, operational, and tactical levels of war.¹²⁸ A specific discussion of operational fires is not addressed, however. To understand operational fires, one must examine other doctrine.

The Army's draft revision of Field Manual 100-5,

Operations, identifies operational fires as:

lethal or non-lethal attack means, directed by the operational commander as a fully integrated component of his campaign plan, with the design and intent to achieve a specified, operationally significant result.¹²⁹

Thus, operational fires differ from tactical fires in terms of desired effects.¹³⁰ The desired effects of lethal operational fires are "to delay, disrupt, destroy, or degrade

enemy operational forces or critical functions and facilities."¹³¹ The desired effects of non-lethal operational fires are "to impair, disrupt, or delay the performance of enemy operational forces, functions, and facilities."¹³²

The Army maintains that, historically, operational fires achieved the following purposes. First, they created an exploitable gap in an enemy's tactical depth and *facilitated friendly ground force maneuver to operational depth*. Second, they isolated the tactical battlefield by the *interdiction* of enemy forces and support not yet committed to combat. Finally, they *destroyed critical functions and facilities* of operational significance.¹³³

Therefore, operational fires are identified, planned, and executed from the "top down," not from the "bottom up," as is the case with tactical fires. Operational commanders "establish objectives, designate targets, and integrate them into plans, [and] then pass them to subordinates for execution."¹³⁴ Operational fires establish conditions for future engagements.¹³⁵

Targets for operational fires include: those the attack of which would prove so decisive as to force an enemy to alter his course of action,¹³⁶ or those which would have a major impact on the campaign or major operation.¹³⁷ Thus, operational fires targets are independent of depth and vulnerable to air forces, cruise missiles, naval gunfire, and special operating forces (SOF).¹³⁸ Targets could include enemy air defense capabilities, command and control, key

infrastructures (power generation facilities, petroleum production and distribution centers, transportation nodes, or bridges), or long range ordnance delivery systems.¹³⁹

The attack of these targets, although individually indecisive, collectively may prove decisive in that their destruction may establish conditions that deny the enemy freedom of action or initiative. Although the enemy's center of gravity may remain unassailable, target groups may represent decisive points the seizure, control, or destruction of which causes the center of gravity to collapse.¹⁴⁰

NAVAL OPERATIONAL FIRE SUPPORT: PRESENT AND FUTURE

A modern navy possesses universality and mobility and is capable of concentrating strike power which may be used not only for fighting a foe at sea but also in the sphere of operations of other branches of the armed forces.¹⁴¹

Admiral of the Fleet, Sergei G. Gorshkov, Soviet Navy

Present naval fires capabilities may be broken down into: attack resources; command, control, and communications systems; and target acquisition and battlefield surveillance assets.¹⁴² To understand the capabilities of naval assets to conduct operational fires against shore targets, it is useful to examine each of these parts.

ATTACK RESOURCES

Navy lethal operational fire systems can be categorized by firing platforms. These classifications are: (1) surface ships, submarines, and ground-launch platforms; (2) aircraft; and (3) Special Operating Forces (SOF). Since all SOF assets are under direction of the Special Operations Command (SOCOM)

and not subject to immediate Navy control, their employment will not be discussed.

The Tomahawk missile system is available in the Navy's inventories to provide naval operational fires.¹⁴³ This missile is available in two variants, the U/R/BGM-109C and the U/R/BGM-109D.¹⁴⁴ These weapons have a maximum range of 700 nautical miles (nms). In the nomenclature "U" denotes submarine variant, "R" the surface ship variant, and "B" the ground-launched variant. The ground-launched variant was not produced, but the capacity to field it remains possible. Tomahawk is a "fire and forget" precision weapon which uses two types of navigation to fly to a precision point in space and deploy ordnance or detonate its warhead. Terrain to database matching guides the missile during the cruise-phase and Digital Scene Matching Area Correlation (DSMAC) maps to exactly locate its terminal target during the attack-phase. The 109C variant uses a conventional high-explosive unitary 1000 pound warhead to attack soft and hardened targets.¹⁴⁵ The 109D family includes variants which permit multiple target attacks by the same missile with sub-munitions modules. One variant "kit" includes 4 payload modules for single or multiple target attacks and additional fuel for increased range. Another "kit" includes 6 payload modules. Each of these contain BLU-97B Combined Effects Bomblets (CEBs) of either armor piercing, fragmentation, or incendiary nature. Suitable targets include revetted aircraft, fixed missile launchers, and air defense sites.¹⁴⁶

The Tomahawk Block III program is funded and will improve weapon performance. Upgrades include cruise-phase guidance based on Global Positioning System (GPS) satellite updates, an improved propulsion engine, insensitive munitions, extended range, and an updated DSMAC correlator for more precise navigation in the attack-phase.¹⁴⁷ These enhancements will provide for faster planning; hence, decreased mission reaction times.¹⁴⁸

Tomahawk missile platforms include ships equipped with Armored Box Launchers (ABLs): the 4 *Iowa*-Class Battleships (all decommissioned), 32 missiles each; 7 *Spruance*-Class Destroyers, 8 missiles each; 4 *Virginia*-Class Cruisers, 8 missiles each; and one *Long Beach*-Class Cruiser, 8 missiles. Ships equipped with Vertical Launcher Systems (VLS) include: 24 *Spruance*-Class Destroyers, 61 missiles each; 22 *Ticonderoga*-Class Cruisers, 122 Missiles each; and 17 programmed *Arleigh Burke*-Class Destroyers, 90 missiles each.¹⁴⁹ Although Tomahawks on VLS equipped ships compete for space with other types of missiles, VLS offers a significant increase in fire power per launch platform.

Additionally, 70 *Sturgeon*-Class and *Los Angeles*-Class submarines are Tomahawk capable through torpedo tube launches and 34 additional *Los Angeles*-Class submarines have 12 vertical launch cells each. All of these submarines possess the ability to launch Tomahawks while submerged.¹⁵⁰

The following list represents those gun systems available to provide naval operational fires, provided the target is close to the shore:

<u>Name</u>	<u>Nomenclature</u>	<u>Payload</u>	<u>Range</u>	<u>Rate of Fire</u> <u>Rounds/Minute</u>
16-inch	16/50Mk7	1900lb (HE)	39,046m	2
		2700lb (AP)		2
5-inch	5/45Mk54	73.8lb (HE)	24,000m	20 ¹⁵¹
	5/45Mk42	73.8lb (HE)	23,000m	26
	5/38Mk28	73.8lb (HE)	16,000m	25
	5/30Mk30	73.8lb (HE)	23,600m	24 ¹⁵²

Several are not immediately available. As noted earlier, the four *Iowa*-Class Battleships are decommissioned. Whether their 16-inch/50calMk7 and 5-inch/38calMk28 systems will remain in the inactive fleet for future reactivation is a matter of debate.¹⁵³

Air delivery means to conduct naval operational fires are centered around carrier-based airwings. With the decommissioning of the A-7s, the "notional" airwing composition becomes: 20 F-14 Fighters, 18 F/A-18 Fighter or Attack Capable Aircraft, 20 A-6 Bombers, 4 KA-6D Tankers, 10 S-3 Anti-submarine Aircraft, 8 HS-3 ASW Helicopters, 5 E-2 Airborne Early Warning Aircraft, and 5 EA-6B Electronic Warfare Aircraft.¹⁵⁴ This mix of aircraft provides for the establishment of local air superiority while meeting the Chief of Naval Operations' goal of 60 offensive aircraft per airwing.¹⁵⁵

These offensive aircraft are capable of delivering lethal and non-lethal operational fires. Platforms able to conduct lethal fires include the F/A-18, the A-6, and the EA-

6B. The F/A-18 has a combat radius of 575 nms and is capable of attacking point and area targets with precision and area weapons. It is capable of launching TV, laser-guided, or Infra-red seeking AGM-65 series Maverick missiles at targets up to 12 nms in range. The Maverick has a 113 pound shaped-charge warhead.¹⁵⁶ Additionally, the F/A-18 is able to drop GBU-10 and -12 laser-guided bombs against point targets or MK-82 and -84 general purpose and CBU-59 cluster bombs.¹⁵⁷

The A-6 has a range of 878 nms and can deliver up to 18,000 pounds of ordnance. It is capable of launching Stand-off Land Attack Missiles (SLAMs) and AGM-88A High-speed Anti-Radar Missiles (HARMs) against land targets.¹⁵⁸ The SLAM is a derivative of the Harpoon surface-to-surface anti-ship missile adapted for land attack use. Although some parameters remain classified, this weapon may be ship- or air-launched, but requires guidance from an A-6 bomber or SH-60B helicopter.¹⁵⁹ It has a range of approximately 70 to 120 nms.¹⁶⁰

The HARM is an anti-radiation homing missile designed to attack broad-band signatures of radars. It has a range of 10 nms and possesses a 130 pound high-explosive warhead.¹⁶¹

Another ordnance system is under development for A-6 employment. The AGM-136 Tacit Rainbow is an anti-radar missile. Believed to possess a 40+ nm range, this missile is designed to passively loiter in the vicinity of a target radar. Upon target radar activation, Tacit Rainbow acquires the signature and attacks the site.¹⁶²

Navy non-lethal fire systems capable of deep fires are located on air platforms and include the EA-6B and the EP-3E. The EA-6B possesses the AN/ALQ-99 jamming system. This jammer has the ability to launch HARMs against radars, unlike its unarmed Air Force counterpart, the EF-111, thus combining the mission of two aircraft and conserving airframes.¹⁶³ The EP-3E possesses the AN/ALQ-76 jamming system and has a 1346 nm mission radius with 3 hours on-station time.¹⁶⁴

COMMAND, CONTROL, AND COMMUNICATIONS SYSTEMS

Of great concern to commanders and mission planners are the command and control aspects of employing these assets. Although individual aircraft carrier airwing strike planning cells are relatively responsive, multiple carrier airwing coordination is problematic.¹⁶⁵ Additionally, Tomahawk planning is part of what must be described as an awkward warfighting system.¹⁶⁶ Planning is performed in two phases. Phase one consists of launch and over-water flight planning and is done on the firing platform, requiring minutes to several hours to perform. Phase two planning generates over-land routes to the target and includes terrain and target defenses avoidance. This function is done ashore at a theater mission planning center.¹⁶⁷

Phase two mission planning represents the shortfall in the system. Awkward and complex, it is relatively unresponsive. A mission can take months to prepare if the required terrestrial maps are not available. Under best-case conditions, this process may require days,¹⁶⁸ due to the

requirement for extreme data accuracy to support precision flight paths. Current phase two planning times depend on the amount of precision data readily available and are generally:

- Digital scenes and maps available = 48 hours.
- Maps available but no digital scenes = 10-14 days.
- No maps available = 30 days.¹⁶⁹

The long lead-time issue, then, becomes the extremely detailed maps required to program the flight data of these weapons' over-land flight profiles. To improve the timeliness of map production and ease of mission planning, the Navy is procuring the NAVSTAR satellite system, producing the Tomahawk Block III weapon, and fielding the Afloat Planning System (APS). The NAVSTAR system has an estimated in-service date of 1993. The amount of planning time NAVSTAR will save remains classified.¹⁷⁰ Coupled with the Block III missile, APS will shorten the planning process and will be more responsive to a commander's interest because it allows for mission route generation over areas where no terrain maps exist. Although accuracy is not improved, these upgrades will expand the number of attackable targets.¹⁷¹

Thus, planning time remains the limiting factor in Tomahawk employment. World-wide map coverage generated by NAVSTAR will enhance the situation, but the enormous cost of this project and the time required to generate this data still places a solution years in the future.

Currently, the Cruise Missile Support Activity maintains the Tomahawk mission repository.¹⁷² This facility maintains a library of pre-planned missions that provide for numerous

scenarios and contingency situations.¹⁷³ These pre-planned missions are stored on magnetic discs (DTDs) and are hand-carried to the launch platforms.¹⁷⁴ Once a mission is loaded into the launch platform's database, existing missions may be modified to facilitate minor changes in target location or missile flight profile.¹⁷⁵ The system is still inflexible, though, as contingency missions must be anticipated and are not very tailorable to emergent requirements.

To meet future Navy Command, Control, Communications, Computers, and Intelligence (C4I) challenges, the Copernicus system is in development.¹⁷⁶ The system is based on four pillars. The first will be the Global Information Exchange System (GLOBIXS), which will provide vessels at sea with information obtained from global and theater-wide sensors. The second pillar will be a Commander-in-Chief (CINC) Command Complex (CCC). This system will link GLOBIXS to shore-based command centers via a Local Area Network (LAN). The CCCs will then be linked to the third pillar, the afloat Tactical Data Information Exchange System (TADIXS). TADIXS is designed to support the Battle Group Commander. Finally, TADIXS will be integrated with Tactical Command Centers (TCCs) aboard command flagships and aircraft carriers. The TCCs will provide displays, integrated information management, and communications to individual ships, submarines, and aircraft.¹⁷⁷

TARGET ACQUISITION AND BATTLEFIELD SURVEILLANCE ASSETS

Target acquisition has always been a challenge in long-range fire support situations. Historically, target detection and observation of fires were performed by ground-based observers and aerial spotters.

During the Vietnam conflict, the use of remotely piloted vehicles (RPVs) increased extensively in response to losses of reconnaissance aircraft. Between 1964 and 1965, over 3435 RPV sorties were flown in Southeast Asia.¹⁷⁸ RPVs saved lives and avoided the political ramifications of captured aircrews.¹⁷⁹ More recently, Israel has utilized RPVs against Soviet-made and Syrian-operated air-defense systems. These RPVs have served in multiple roles including electronic countermeasures, photo-reconnaissance, and deception.¹⁸⁰ Their resolution can approach the accuracy enjoyed by more sophisticated overhead imagery systems at a fraction of the cost.

The Navy started RPV operations after losing several aircraft over Lebanon in 1983. The RPVs were purchased from Israel and were utilized for reconnaissance and naval surface fire support spotting.¹⁸¹ More recently the Navy operated Pioneer RPVs. These platforms had a ceiling of 15,000 feet, travelled at speeds up to 70 knots, had a range of 100 nautical miles, and had an endurance of 9 hours.¹⁸²

The Pioneer system performed well in the Gulf War for all branches of U.S. military service. The vehicles flew 533 sorties, logged 1,688 flight-hours, and ranged up to 75-80

nas from their control stations.¹⁸³ Although twelve of these vehicles were lost during the conflict, the manufacturer believes that only two were combat losses.¹⁸⁴ Additionally, these vehicles observed all battleship 16-inch gun firings and were continuously airborne during Desert Storm.¹⁸⁵

The advantage of the Pioneer RPV system was its video data link¹⁸⁶ which provided real-time reconnaissance, fall-of-shot observation and adjustment, and battle damage assessment.¹⁸⁷ This enabled commanders to: observe targets from ranges safe at sea; update missile flight paths to reflect verified real-time target location; observe ordnance impact on target; and conduct Battle Damage Assessment (BDA) in possibly the same sortie.

Unfortunately, the Navy's Pioneer systems were only fielded on battleships. Thus, Pioneer is no longer available to the fleet. Although Copernicus will eventually link national assets to fleet units, this is unforeseen within at least ten years.¹⁸⁸ Therefore, "overhead" information remains unavailable to most fleet units.

Therefore, individual Carrier Battle Groups (CVBGs) rely upon their organic airwing reconnaissance capabilities. Although any strike-capable aircraft can theoretically perform reconnaissance and provide its own post-mission BDA, these functions are easier said than done. Thus, reliance upon specialized aircraft performing photo-reconnaissance and information obtained from mission data recorders onboard strike aircraft remains high.

The only naval aircraft capable of performing photo-reconnaissance and BDA is the Tactical Air Reconnaissance Pods System (TARPS)-configured F-14. TARPS is comprised of a KS-87B frame camera, a KA-99 low altitude panoramic camera, and a AN/AAN-5 infra-red system. TARPS configured F-14s have a 1735 nm range.¹⁸⁹ The number of TARPS pods is limited. Thus, the Navy is limited in its ability to conduct reconnaissance and BDA on operational targets ashore.

CONTEMPORARY EXAMINATION: THE GULF WAR

The conflict resulted from the Iraqi invasion of Kuwait on 02 August 1990. In response, the Allied Coalition developed two strategic aims: first, to deter further Iraqi aggression into Saudi Arabia (Operation Desert Shield), and second, to force an Iraqi withdrawal from Kuwait (Operation Desert Storm).¹⁹⁰ Many military thinkers believe that President Hussein of Iraq was thwarted from further regional hegemony by the rapid reaction of international leadership. Perhaps his drive further south into Saudi Arabia was halted by the rapid response of the U.S. Navy.¹⁹¹ On 06 August 1990, the U.S. Secretary of State received a formal request for assistance from the Saudi Crown. This plea was met by a massive international force deployment, with the U.S. military's rapid reaction forces leading the way. By 07 August 1990, two Navy CVBGs were on-station and prepared for action.¹⁹² For whatever reason or reasons, however, deterrence prevented further Iraqi aggression, but failed to force an Iraqi withdrawal from Kuwait. Despite international

diplomatic actions, Iraqi leadership remained intransigent, and the Iraqi military was ejected by force in a manner which relied heavily on operational fires.

The military operation was a joint and combined operation, relying on force from all branches of the U.S. military structure, military forces from eighteen nations, and financial and non-military support from twenty-eight nations.¹⁹³ During this conflict, the U.S. Navy significantly contributed to the outcome of the war through the application of operational fires.

The lack of a credible Iraqi naval threat allowed the Allied naval armada to make early contributions to the major air operation and subsequent ground combat operation. After establishing local sea control in the Mediterranean Sea, the Red Sea, and the southern area of the Persian Gulf, power projection was conducted ashore via strike warfare against Iraqi operational targets.

In the first 24 hours of the major air operation, total operational and tactical surprise was achieved as 196 Tomahawk and several SLAM missiles attacked critical targets and decisive points throughout the depth of the Iraqi defensive scheme. The Iraqi integrated ground-based air-defense system, national communications, weapons of mass destruction, vital infrastructure, and offensive and defensive air capabilities were identified as decisive points and attacked first.¹⁹⁴ The Navy fired a total of 216 Tomahawks

in the first 48 hours and a total of 288 during the conflict. Of those fired, 85% of the missiles were judged successful.¹⁹⁵

Assuming that attack of these operational decisive points was **NECESSARY**, these attack needs were fulfilled by both the Tomahawk and SLAM missiles initially, and with follow-on carrier-based aviation strike assets thereafter. These missiles and aircraft were **SUFFICIENT** to meet the requirement in terms of their **SUFFICIENT** range (up to 700 nms), firepower (1000 pound warheads), and delivery accuracy (circular errors of probability between one and ten feet). Of these systems, the Tomahawk missile was perhaps the most **SUFFICIENT** as demonstrated by the increased number of enemy facilities that Tomahawk brought under fire with less risk as when compared with conventional gunfire or manned systems.¹⁹⁶

The capability to successfully attack many operational targets using Tomahawk missiles with relatively little or no risk is best exploited in the third-world nations like Iraq. Due to the austere nature of these countries' infrastructures, the number of critical nodes and the availability of alternative facilities is limited. Although Iraq possessed many hardened sites, this is an anomaly in the third-world, where few facilities are hardened, and the capacity to repair damage is limited.¹⁹⁷

Navy missile and aviation systems are **SUITABLE** for use against operational targets in that they deliver ordnance on target with great accuracy. As demonstrated in the Gulf War, Tomahawk and SLAM possess the capability to achieve pinpoint

accuracy and thus, are **SUITABLE** for employment early in an operation when manned aircraft strikes may be too risky. The **SUITABLE** missions for these weapons are limited only by imagination. Additionally, surprise can be further magnified through Tomahawk launch by submarines able to covertly launch their missiles.¹⁹⁸ As further proof of surprise, it must be noted that the Tomahawk missiles which struck their targets in Baghdad arrived with as much if not more stealth than their manned one hundred million dollar counterparts, the F-117 Fighters.¹⁹⁹

The accuracy and range performance of these weapons systems during the Gulf War fully demonstrated the **FEASIBILITY** these weapons possess in their ability to deliver ordnance. The multiple target attack capability of some Tomahawk variants demonstrated that it is **FEASIBLE** for individual Tomahawk missiles to perform the mission of several strike aircraft, preserving these scarce and valuable assets for follow-on missions.

Of great value, then, is the **ACCEPTABLE** manner in which these weapons executed their missions. These missiles complemented the employment of subsequent strike aircraft missions by softening or destroying heavily defended targets and preventing unnecessary attrition of manned aircraft,²⁰⁰ and thereby preserved the reusable asset and safeguarded aircrew's lives. Additionally, cruise missiles, due to their pinpoint accuracy, attacked their targets with less

collateral damage to nearby civilian installations than may have been caused by manned aircraft attack.²⁰¹

Thus, it is more **ACCEPTABLE** to send a cruise missile into danger than an aircraft. Reasonable men demonstrate a natural reluctance to accept unnecessary casualties in one's own force. This desire to limit casualties extends to the enemy civilian population as well, and is manifested by a desire not to incur public outcry over the human rights of innocent victims located near military targets.²⁰² The ex-Deputy Chief of Naval Operations for Surface Warfare eloquently summed up this argument after the Gulf War. He questioned, "Why is a man still required to bring his airplane to the target, risking his machine and himself, just to line up the sight?"²⁰³ Technology has obviated the requirement to endanger men's lives to deliver ordnance on target. At issue, then, is whether or not it is **AFFORDABLE** to employ these systems as operational fires.

Their **AFFORDABILITY** represents one of the best arguments in favor of the use of the Tomahawk and SLAM missiles. Some would choose to argue that these weapons are expensive and will be scarce when compared to the inventory of air-delivered iron bombs and non-technologically advanced projectiles.²⁰⁴ Tomahawks, however, are

expensive compared to what? The Tomahawk is usually compared to an iron bomb; [1.2] million dollars versus \$55,000. The comparison excludes the launching platform--the airplane, its equally expensive support system, and people. The Navy or Air Force attack aircraft or bomber requires pilots and maintenance crews--people who must be paid, trained, and housed. Several thousand cruise

missiles might require no more than a dozen technicians. Furthermore, cruise missiles do not require air bases with commissaries and government quarters.²⁰⁵

In terms of dollars, then, missiles are a bargain.

Just like any expensive asset, however, these missiles should be reserved for those targets worth the cost. The Tomahawk is capable of penetrating sophisticated target defenses and delivering its warhead with precise accuracy. If the "cost" of the mission is driven by expected aircraft attrition rates, or if the airwing is otherwise engaged, then the Tomahawk is an appropriate choice of strike weapon.²⁰⁶

A final point concerning **AFFORDABILITY** of cruise missiles remains the consideration of downed airmen. These prisoners-of-war become bargaining chips to their captors as their lives become media currency, as shown during the Vietnam Conflict. The impact of this issue alone may represent the cost a nation is unwilling to bear in any conflict short of total war. In light of this consideration, cruise missiles can perform operational fires missions and, as such, represent an **AFFORDABLE** and relatively risk-free asset.

Once air superiority or air supremacy is achieved, manned strike aircraft represent another means to deliver operational fires. Possibly a limiting factor in manned naval aircraft employment is the requirement to provide ECM-capable aircraft for "strike package" escort. In this arena, the Navy EA-6B offers the distinct advantage of being able to provide ECM services and attack acquired enemy fire control radars using HARM missiles.²⁰⁷ To illustrate, Navy and Marine Corps aircraft launched more than 80% of the HARMS employed in this conflict.²⁰⁸ The 39 EA-6Bs in theater conducted 60% of

the Suppression of Enemy Air Defense (SEAD) missions flown during Desert Storm.²⁰⁹ So critical were EA-6B employment, that their availability for inclusion in "strike packages" became "go" or "no go" criteria.²¹⁰ Thus escorted, it is **FEASIBLE** and **ACCEPTABLE** for naval air assets to attack operational targets.

It remains illogical, however, to "hazard a manned aircraft when a projectile will do the job."²¹¹ Missile systems have demonstrated the ability to perform strike missions as well if not better than manned aircraft armed with precision munitions.

CONCLUSIONS

And while earlier the crux of the efforts of a fleet was directed against the enemy fleet, now the chief goal of a fleet is becoming that of ensuring the fulfillment of all tasks associated with action against [the] enemy. . . .²¹²
Admiral of the Fleet Sergei G. Gorshkov, Soviet Navy

Despite the end of the Cold War, the U.S. Navy's strategic concepts of "sea control" and "power projection" are sufficient to direct broad employment of maritime forces. These principles adequately direct the application of the Navy's military means in support of the national security and military strategies. However, a vast void exists in the direction of the ways to employ these means. The principles and theories of warfare should form a foundation and point of departure for doctrine concerning the application of military means. The Navy lacks a clear theoretically-based doctrine delineating how to apply tactical means to achieve strategic aims.

Emerging joint doctrine falls short of clearly defining operational art and functions at the operational level. The doctrine of other services, however, adequately fills the void of linking tactics to strategy. It is merely necessary to transplant this knowledge and understanding to naval officers.

Unlike the Allied naval forces at Gallipoli, the U.S. Navy clearly possesses the tactical means to engage targets at the operational level. As demonstrated in the recent Gulf War, Tomahawk missiles and other precision-guided munitions represent the means to deliver operational fires. Combined with available manned aircraft, these Navy means achieve a synergistic effect on operational targets. One facilitates the other. All is not well, however.

Tomahawk planning is cumbersome, battle damage assessment is difficult, command and control does not reflect the achievements of emergent technology, and carrier aviation is aging. Although these problems and others identified with respect to joint participation of the Navy carrier aviation during the Gulf War have commanded attention, the future health of aviation-delivered naval fires lacks near-term corrective action. The A-6 bomber is thirty-two years old, and the F/A-18 is over twelve years old. New aviation platforms are required, but they may not be affordable. Precision guided munitions are cheaper, and although the mystique of Top Gun is great, it may go the way of the horse cavalry.²¹³ Just as Samuel Colt said over a hundred year ago,

"never send a man where you can send a bullet!"²¹⁴ Now that the U.S. Navy possesses the technology, planners should apply these means where it can best contribute, because the obvious lesson of the Gulf War is that technology works²¹⁵ and this trend may well continue. If so, then the margin of this advantage may diminish as other countries attempt to exploit the possibilities of emerging smart munitions. Finally, the importance of technological considerations in modern warfare is critical. So much so, that if Clausewitz was alive today:

he would not only be unable to ignore the role of technology in war, but would actually incorporate it into his basic theoretical framework as an important independent force.²¹⁶

IMPLICATIONS

To fully support the concept of the operational level of the war, the Navy must establish an educational program to intellectually indoctrinate its officer corps. Joint education represents a good point of departure. Additionally, the Copernicus command and control system represents an excellent means to conduct operational-level direction, but this system must be fully integrated with theater- and national-level systems. Once integrated, naval operational fires system will become very responsive to higher direction. The positive steps currently underway to improve the responsiveness of the Navy's Tomahawk missile planning system represent vast improvements. They serve to make this extremely accurate asset responsive to operational-level commanders.

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